

# Guideline: Management of First Seizure and Status Epilepticus

---

## Purpose

This guideline outlines key principles in the management of patients presenting with a first seizure and status epilepticus.

## Scope of Use

All EC medical staff

## Guideline

### FIRST TIME SEIZURE WITH SPONTANEOUS RESOLUTION

1. Identification: Was it a seizure? Consider mimics (pseudoseizure, syncope)
2. Check serum GLUCOSE. Treat hypoglycaemia as indicated.
3. Was it a TYPICAL seizure in a patient with a documented history of seizures?
  - Check serum levels of anti-epileptic drugs (AED), assess med compliance, consider changes in therapy in cooperation with the GP or neurologist.
4. Is there clinical suspicion for SAH, meningoencephalitis, or immunocompromise?
  - Perform an emergent non-contrast HEAD CT
  - If CT is normal, all require LUMBAR PUNCTURE
5. ASSESS all patients for:
  - Patient has NOT returned to previous neurological baseline
  - New focal neurological deficit
  - Persistent altered mental status
  - Fever or persistent headache
  - Recent head trauma
  - Recent hypoxic insult
  - Alcohol or drug intoxication
  - Alcohol or drug withdrawal
  - History of cancer or immunosuppression
  - Focal or partial onset seizure
  - Anticoagulation or coagulopathy
  - History of CVA or TIA
  - Age over 40 years
6. Perform SELECTIVE laboratory testing

<b>Document ID:</b>	A2934	<b>CMH Revision No:</b>	4.0
<b>Department:</b>	Emergency Care	<b>Last Updated:</b>	22/10/2015
<b>Document Owner:</b>	Emergency Medicine Consultant	<b>Next Review Date:</b>	22/10/2017
<b>Approved by:</b>	Clinical Head EC	<b>Date First Issued:</b>	01/08/2007
<b>Counties Manukau District Health Board</b>			

## Management of First Seizure and Status Epilepticus

- The minimum is a serum glucose and sodium level and a pregnancy test in women of childbearing age.
  - Check serum AED levels in patients who are on these drugs.
7. Are there any OTHER REASONS preventing discharge?
- Elderly or debilitated patient?
  - Mental illness?
  - No supervision at home?
  - Barriers to follow-up (car, telephone)?
  - Unstable social situation, particularly in vulnerable young or elderly?
8. If workup from above is all normal, the patient may be discharged home.
- Do NOT routinely initiate AED therapy for first time seizure.
  - Be sure to assure appropriate GP or neurology follow-up.
  - Restrict driving privileges.
  - Warn about other dangerous activities (swimming, operation of machinery, etc).
  - These restrictions may be reviewed upon follow-up.

<b>Document ID:</b>	A2934	<b>CMH Revision No:</b>	4.0
<b>Department:</b>	Emergency Care	<b>Last Updated:</b>	22/10/2015
<b>Document Owner:</b>	Emergency Medicine Consultant	<b>Next Review Date:</b>	22/10/2017
<b>Approved by:</b>	Clinical Head EC	<b>Date First Issued:</b>	01/08/2007
<b>Counties Manukau District Health Board</b>			

## STATUS EPILEPTICUS

Defined as: A single continuous seizure with a duration greater than 5 minutes, OR

2 or more clinical seizures without an inter-ictal return to the baseline clinical state.

### 1. Initial Assessment and "IV O2 Monitor Glucose"

- Perform general evaluation with close attention to the Airway, Breathing, and Circulatory status.
- Neurological examination
- Oxygen, consider need for intubation and ventilation
- IV catheters - at least 2, at least 1 should be large-bore in the antecubital fossa. This is crucial, as all benzodiazepines will precipitate phenytoin!
- Start a bolus of Normal Saline. Dextrose containing fluids should be avoided as they will precipitate phenytoin
- Fingerstick glucose
- Laboratory Evaluation: FBC, electrolytes, LFTs, ABG minimum
- Consider toxicologic screening in selected cases
- Frequent vital signs
- Consider immediate glucose, IV thiamine
- Consider the possibility of specific **immediately treatable causes**: eclampsia, withdrawal syndrome, metabolic abnormalities (esp. hypoglycemia and hyponatremia), Isoniazid overdose (give pyridoxine)

### 2. Initial Therapy

#### In the First IV

- **Lorazepam** 0.02 to 0.03 mg/kg IV initially. Wait 1 minute for response, then repeat with additional dose up to 0.1 mg/kg IV total maximum dose. Maximum rate is 2 mg/min
- Alternatives: **Diazepam** 0.1mg/kg IV, **Midazolam** 0.05 mg/kg IV

#### In the Second IV

- **Phenytoin** 20 mg/kg IV at 25-50 mg/min OR **Fosphenytoin** 20 mg/kg PE (Phenytoin Equivalents) at 50-125 mg PE/min
- Alternatives: **Sodium Valproate** 400-800 mg (max. 10 mg/kg) slow IVI then 1-2 mg/kg/hour continuous infusion; max. 2,500 mg/day

If IV access cannot immediately be established, begin therapy with:

**Midazolam 0.15 mg/kg IM or Diazepam rectally 0.5 mg/kg PR.**

DO NOT DELAY!

DO NOT hesitate to place a central line if necessary. Short-term use of a femoral line is ideal in this situation.

Document ID:	A2934	CMH Revision No:	4.0
Department:	Emergency Care	Last Updated:	22/10/2015
Document Owner:	Emergency Medicine Consultant	Next Review Date:	22/10/2017
Approved by:	Clinical Head EC	Date First Issued:	01/08/2007
Counties Manukau District Health Board			

### 3. Correct metabolic abnormalities if present, further general supportive care (Volume expansion with crystalloid, oxygen, etc.)

### 4. Airway management

- No absolute guidelines exist to make the decision if and when any given patient will require intubation.
- Hypoxia and acidaemia greatly contribute to the degree of brain injury.
- All patients treated with barbiturate coma will need intubation.
- Status epilepticus patients have significant aspiration risk.
- Short-term paralysis may be needed for patient management in some cases where an immediate CT scan must be performed (concern for cerebral hemorrhage as the cause of the seizures).
- Intubation should be performed by the most experienced available operator using a **Rapid Sequence Intubation** technique and short-term paralysis with succinylcholine. Take great care to avoid hypoxia. Induction agents are generally not needed.

### 5. Paralysis in Status Epilepticus

Long-acting paralytics such as vecuronium are strongly discouraged. A paralyzed patient may still have cerebral status epilepticus, which will then go unrecognized. The same effect can occur with pentobarbital, as it may abolish motor activity before stopping the cerebral seizure activity.

### 6. Second-line Therapy

Second dose of **Phenytoin**: 10 mg/kg PE

### 7. Is the patient still in Refractory Status Epilepticus (RSE)?

**Most of these patients will have required endotracheal intubation by this point.**

Further pharmacological management is guided by the answers to these three questions:

- Is the patient **hemodynamically stable**?
- Is the patient **hemodynamically unstable**?
- Is the patient at **high risk for respiratory failure** and prolonged ventilator dependence?

### 8. Hemodynamically Stable RSE

**Phenobarbital** 20 mg/kg IV at 100 mg/min

If unsuccessful:

**Pentobarbital** 10 mg/kg IV at 100 mg/min, and continue repeat doses until seizure stops

Continue:

**Pentobarbital** 1 to 4 mg/kg per hour IV for 24 hours seizure free, then slowly taper slowly. Maintain therapeutic levels of phenytoin and/or phenobarbital.

Document ID:	A2934	CMH Revision No:	4.0
Department:	Emergency Care	Last Updated:	22/10/2015
Document Owner:	Emergency Medicine Consultant	Next Review Date:	22/10/2017
Approved by:	Clinical Head EC	Date First Issued:	01/08/2007
Counties Manukau District Health Board			

### 9. Hemodynamically Unstable RSE

**Midazolam** 0.2 mg/kg IV bolus followed by infusion at 0.05 to 0.5 mg/kg per hour.

If seizures persist after 45 minutes, then:

**Propofol** OR **pentobarbital** infusion WITH pressor support

### 10. Risk for prolonged ventilation (expected difficult ventilator wean)

**Propofol infusion** start at 1 to 2 mg/kg per hour, titrate to termination of seizures. This may require a rate as high as 10 - 12 mg/kg/hour.

After seizures controlled, maintain the lowest effective rate for 24 hours, then taper down at 5 percent per hour.

If seizures persist 45 minutes on propofol infusion, then:

**Pentobarbital** bolus and infusion as above.

## References

## Definitions

Terms and abbreviations used in this document are described below:

Term/Abbreviation	Description
ABG	Arterial blood gas
AED	Anti-epileptic drugs
CVA	Cerebrovascular accident
LFTs	Liver function tests
RSE	Refractory status epilepticus
SAH	Subarachnoid haemorrhage
TIA	Transient ischaemic attack

## Associated Documents

None

<b>Document ID:</b>	A2934	<b>CMH Revision No:</b>	4.0
<b>Department:</b>	Emergency Care	<b>Last Updated:</b>	22/10/2015
<b>Document Owner:</b>	Emergency Medicine Consultant	<b>Next Review Date:</b>	22/10/2017
<b>Approved by:</b>	Clinical Head EC	<b>Date First Issued:</b>	01/08/2007
<b>Counties Manukau District Health Board</b>			